

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 19 January 2001 (19.01.01)	<b>Applicant's or agent's file reference</b> 00D936WO
<b>International application No.</b> PCT/NZ00/00092	<b>Priority date (day/month/year)</b> 08 June 1999 (08.06.99)
<b>International filing date (day/month/year)</b> 07 June 2000 (07.06.00)	
<b>Applicant</b> BOLLEN, Arthur, Frank	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

02 January 2001 (02.01.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

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**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

REC'D 15 MAY 2001

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Applicant's or agent's file reference OOD936WO	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/NZ00/00092</b>	International Filing Date ( <i>day/month/year</i> ) 7 June 2000	Priority Date ( <i>day/month/year</i> ) 8 June 1999
International Patent Classification (IPC) or national classification and IPC Int. Cl. <sup>7</sup> B65D 81/18; 88/74, 3/22		
Applicant QPOD SYSTEMS LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 6 sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of sheet(s).
3.	This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input checked="" type="checkbox"/> Certain observations on the international application

Date of submission of the demand 2 January 2001	Date of completion of the report 3 May 2001
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  A. ALI Telephone No. (02) 6283 2607

**I. Basis of the report**1. With regard to the **elements** of the international application:\*

- ☒ the international application as originally filed.
- ☐ the description,      pages , as originally filed,  
                                          pages , filed with the demand,  
                                          pages , received on    with the letter of
- ☐ the claims,      pages , as originally filed,  
                                          pages , as amended (together with any statement) under Article 19,  
                                          pages , filed with the demand,  
                                          pages , received on    with the letter of
- ☐ the drawings,      pages , as originally filed,  
                                          pages , filed with the demand,  
                                          pages , received on    with the letter of
- ☐ the sequence listing part of the description:  
                                          pages , as originally filed  
                                          pages , filed with the demand  
                                          pages , received on    with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description,      pages
- ☐ the claims,      Nos.
- ☐ the drawings,      sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be nonobvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos: **28 and 29**

because:

☒ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

Claims 28 and 29 do not comply with PCT Rule 6.2 (a) as they rely on references to the description and drawings in respect of their technical features.

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claim Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	<b>YES</b>
	Claims <b>1-27</b>	<b>NO</b>
Inventive step (IS)	Claims	<b>YES</b>
	Claims <b>1-27</b>	<b>NO</b>
Industrial applicability (IA)	Claims <b>1-27</b>	<b>YES</b>
	Claims	<b>NO</b>

**2. Citations and explanations (Rule 70.7)****NOVELTY (N)**

The following documents were found to be relevant to the claims in assessing novelty:

US 5548967 A (relevant to claims 1-27)

WO 95/22729 A (relevant to claims 1-27)

EP 0832826 A (relevant to claims 1-27)

SU 1784134 A (Derwent abstract) (relevant to claims 1-27)

RU 2078494 C1 (Derwent abstract) (relevant to claims 1-27)

FR 2649381 A (relevant to claims 1-8, 10-14, 26, 27)

US 4386703 A ( relevant to claims 1-8, 10-14, 26, 27)

NOTE : FR ' 381 and US ' 703 do not disclose gas moving means to direct a flow of gas.

**INVENTIVE STEP (IS)**

The claims lack an inventive step over the citations listed above as the subject matter claimed in the claims would be rendered obvious in view of the teachings in the citations.

**INDUSTRIAL APPLICABILITY (IA)**

The claims are directed to subject matter that is definitely applicable to industry.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claims 1-8, 26 and 27 are not supported by the description as they do not define a gas moving means which appears to be a characteristic feature of the invention.
2. Claim 5 is not clear as there is no prior reference to "the pair pathways".

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 December 2000 (14.12.2000)

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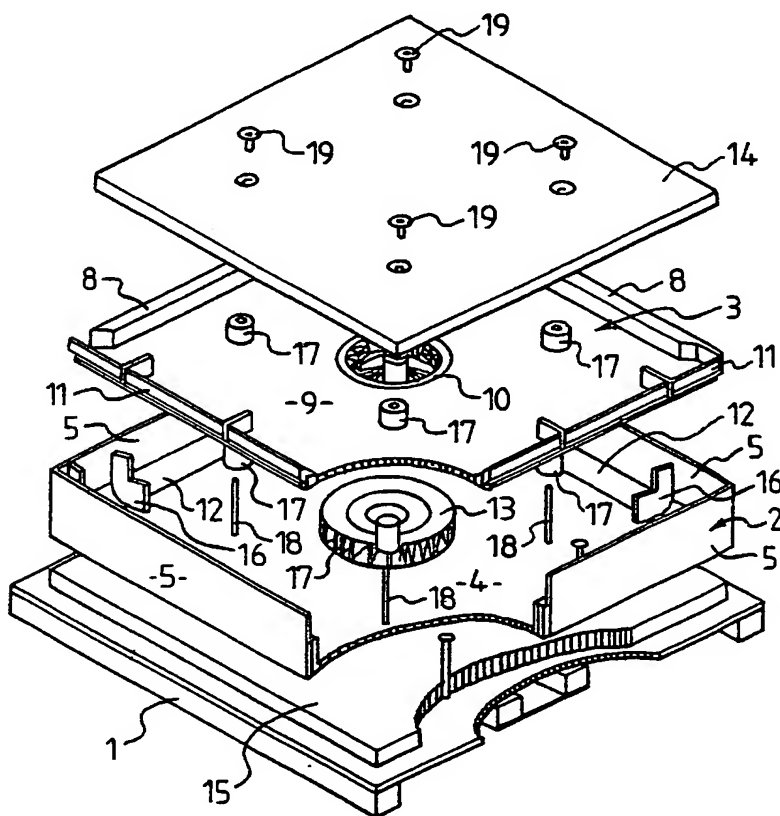
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- (72) Inventor; and  
(75) Inventor/Applicant (*for US only*): BOLLEN, Arthur, Frank [NZ/NZ]; Old School Road, Ngahinapouri (NZ).
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[Continued on next page]

(54) Title: CONTAINER

(57) Abstract: The invention relates to containers which can be placed within a shipping container. At least one wall (20, 21, 22, 23) of the container has ducts (32, 33) through which cooling (or heated) gas may pass.



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IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- *With international search report.*
- *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*



## **CONTAINER**

### **TECHNICAL FIELD OF THE INVENTION**

This invention relates to a container which has been devised particularly though not necessarily solely for the transport of fresh produce such as vegetables, fruit, fish and meat. It is envisaged  
5 however that other items such as semiconductors and the like could also be transported in the containers of the invention.

### **BACKGROUND ART**

Accurate temperature control during the transportation of perishable products in a container is important in order to maximise their storage or shelf life. Distribution of temperature controlled  
10 air within a transport vehicle or storage facility is an important feature of the refrigeration system.

The smaller the transport or storage container the greater its surface area is in relation to its volume. Heat is gained by transfer through the walls of the transport container. The smaller the  
15 container, the greater percentage of its cargo volume that is in contact with or in close proximity to the containers' walls (the surface area) thus making it harder to refrigerate.

The means by which temperature controlled air is circulated within a transport container is vitally important in order to avoid hot spots developing in the perishable cargo. The most  
20 common methods of air circulation used in refrigerated transport systems is either bottom air delivery or top air delivery into the container.

Typically the refrigeration plant is mounted at one end of the transport vehicle. Air is cycled through heat transfer coils, then passes into a single air duct entering the cargo area, either along

the containers' floor or roof, and returns through a single inlet, also located at the machinery plant end of the transport vehicle, but usually at the opposite side to the outlet duct. For example, in a refrigerated sea container, if the outlet duct is positioned near the floor of the cargo area then the inlet duct would be positioned near the roof of the cargo area. The air distribution cycle is continuous during the refrigeration process.

For refrigerated trucks and sea containers this method is considered by operators to be satisfactory. Variations in perishable products temperature measured at different locations within transport vehicles are commonly acknowledged but generally within acceptable limits for the trade.

Applying the same air distribution system to smaller containers, (the size of a loaded pallet) has not been successful due to a larger percentage of the perishable cargoes' volume being in contact or in close with, or close proximity to the containers' walls.

## OBJECT

It is therefore an object of the present invention to provide a container which will go at least some way towards obviating or minimising the foregoing disadvantages in a simple yet effective manner or which will at least provide the public with a useful choice.

## DISCLOSURE OF INVENTION

Accordingly in one aspect the invention consists in a container comprising a base, a plurality of side walls and a top, at least some of the side walls having ducts therein through which gas can flow.

In a further aspect the invention consists in a container comprising a base, a plurality of side walls and a top, there being ducts within at least some side walls, and a gas moving device arranged to direct gas through said ducts.

In a still further aspect the invention consists in a method of maintaining the temperature of or cooling a container having a top, a bottom, and a plurality of side walls comprising the steps of directing a flow of gas at the desired temperature up or down through one or more sides of the container and allowing the gas to return down or up through other side walls, or through the body of the container.

To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

#### BRIEF DESCRIPTION OF DRAWINGS

One preferred form of the invention will now be described with reference to the accompanying drawings in which:

**Figure 1** is an exploded third angle view showing the base of a container according to the invention;

**Figure 2** is a cross sectional view of the lower end of a container according to one preferred form of the invention;

**Figure 3** is a slightly exploded view of a junction between a wall and the base of the container of Figures 1 and 2;

**Figure 4** is a diagrammatic representation of the walls and top of a container according to the invention;

**Figure 5** is a corner detail of the container of the invention;

**Figure 6** is an enlarged view of the end of a fluted side wall according to the invention;

- Figure 7** is a simplified drawing of an arrangement of the sides of the invention;
- Figure 8** show gas paths across the top of the container in the preferred form of the invention;
- Figure 9** as for Figure 8;
- 5 **Figure 10** shows the arrangement of a preferred form of top for the container;
- Figure 11** shows a top corner connector for a preferred container;
- Figure 12** shows a cross section of the connector of Figure 11;
- Figure 13** is a corner assembly for the container of the invention;
- Figure 14** shows Figure 13 in exploded form;
- 10 **Figure 15** shows the detail of the junction between the side walls and the base of one intersection thereof being the gas receiving intersection to the base;
- Figure 16** is a similar detail but showing the gas supply intersection between the base and the side walls;
- Figure 17** is a diagrammatic side elevation of an alternative embodiment of a container  
15 according to the invention;
- Figure 18** is a diagrammatic perspective view of the container of Figure 17;
- Figure 19** shows a further alternative container according to the invention;
- Figure 20** shows a still further alternative container according to the invention; and
- Figure 21** (a) to (n) is a series of drawings showing an erection sequence of a container.

## BEST MODE FOR CARRYING OUT THE INVENTION

Referring to Figures 1 to 16, a container is provided as follows:

The container comprises a base, a top and a plurality, preferably four, side walls. The base may  
5 be mounted on a pallet 1. Means are provided to move gas in a manner that will be described in  
more detail hereinafter and the means may be in the base or the top. In the preferred form the gas  
moving device is in the base. In such a construction the base comprises two parts being a lower  
part 2 and an upper part 3. In one preferred form of the invention gas will be moved upwardly  
and within two side walls of the container and downwardly and within two side walls. Other  
10 variations are able to be provided such as up one side and down one side, up three side walls and  
down one or up one and down three. Other alternative, include up four walls and down through  
the body of the container and allowing the gas to enter the body of the container at various points  
up the side walls. In the up two walls, down two walls version the lower part 2 is provided with a  
base 4 and perimeter walls 5 are provided on the base 4. The upper part 3 has a base 7 and walls  
15 8 and 9 on the two edges thereof. The base 7 of the upper part 3 has a central aperture 10 through  
which gas can pass. The other two sides of the base 7 may have a curved side wall 11  
thereabouts to assist in directing the in gas flow in use. The sides of the base 4 also carry a  
curved wall so that the side of base 4 which carry a curved wall 12 sit under sides of base 7 which  
do not carry a curved wall. A gas moving device such as a radial fan 13 is provided to move gas  
20 through the central aperture 10. A top plate 14 is provided above the upper part 3 so that in effect  
upper and lower plenum chambers are provided in the base along with the gas moving device. A  
layer of insulation 15 may be provided between the base and the pallet as shown in Figures 1 and  
3. The base 9 may rest on notched vanes 16 carried on the inside of walls 5. The vanes 16 also  
direct air evenly into the duct. The base 9 and top plate 14 are also supported by spacers 17  
25 through which bolts-18 pass to secure the construction by use of nuts 19.

The walls of the container comprise walls 20, 21, 22 and 23 of which one for example the wall 23  
may be in the form of a door. Thus the side walls 21 and 23 for example may be wider than walls  
20 and 22 so that walls 21 and 23 overlap the ends of the side walls 20 and 22 as can be seen in

Figure 7. In the preferred form of the invention the walls are made from fluted cardboard and a satisfactory cardboard is correctly provided by Carter Holt Harvey Limited and sold under the trade mark M FLUTE. This board provides sufficient rigidity and also provides flutes which  
5 form ducts along which the gas for example air can pass. In the construction as shown in Figure 5 the wall 20 butts against a face of the wall 21 and a tape 25 is passed vertically and around the corners to hold the walls in position. The container is also usually wrapped in plastic wrap. In Figure 6 the wall 21, for example, is shown it can be seen that the outer surface has a double thickness of cardboard at 26 and that the inner wall 27 has been extended around the end of the  
10 wall 28 and secured back to the outer surface at 29.

The top includes one or more chambers and a satisfactory construction is substantially as shown in Figure 10 in which two layers of the fluted cardboard are provided being layers 30 and 31 in which the flutes 32 and 33 are substantially at right angles. This keeps the air flows separate and enables the air to pass up one wall such as wall 20 through flutes such as flutes 33 and down the  
15 other side wall such as side wall 22. It will be apparent of course that a single plenum could be provided or two plenum chambers without the flutes but it is believed that the preferred embodiment comprises the construction as shown in Figure 10. Figure 11 shows one way of completing gas passageways from say wall 20 to top part 30. A connector 45 is provided having gas passageways 48 between face 46 and face 47. There may be dividers 49 within the  
20 passageways 48. The faces 46 and 47 are recessed at 50, 51 to provide a female member into which the side panel 20 and top panel 30 engage. Other connections can be similarly made. An alternative method is simply to "V" notch a length of cardboard in two places so that the length folds up to form a pair of sides separated by a top with the flutes aligning at the folds. The embodiment in Figure 9 shows this type of construction.

25 Thus by reference to Figure 8 air passes up wall 20 into top part 30 and down walls 22. Figure 13 shows the corner assembly which it can be seen that the flutes in wall 20 terminate at a lower level than the flutes in wall 21 and the extension 35 can be seen. The inner face of the walls could have the cardboard replaced by material which transfers heat more readily but which gives sufficient strength such as a metal sheet for example although this has the disadvantage that the

container walls may not be so readily disposed of at the receiving end. Also an array of holes could be provided on the gas supplying and gas receiving walls so that the gas passes through the produce rather than over the top or as well as through the top. Such a construction is of particular  
5 advantage when the produce is horticultural items. In such a construction selected pathways can be blocked to force flow through the produce.

Air flows up two opposite sides and down the remaining two opposite sides are also possible.

10 That is the air flow is across a corner.

Referring to Figures 15 and Figures 16 it can be seen that air will return down the side flutes for example wall 23 in the direction of arrow 40. The gas moving device 13 such as a radial fan will move that gas through the aperture 10 into the lower chamber where it is enabled to move up the  
15 flutes in wall 21.

In one base chamber a refrigeration unit (not shown) or heating unit is provided. It is expected that usually a cooling unit will be provided, but a heating unit may be used, or both heating units and cooling units can be provided.

20 In use the door 23 is opened and produce or items stacked within the container. The door 23 is closed and insulation panels 50 indicted in Figure 2 and 3 are placed about the container. These are then taped so as to be secure in position and a tape is indicated at Figure 51. Other fixing devices could be used as available.

25 Once closed the container of the invention may be shipped as desired for example within a shipping container or individually as suitable.

Power is supplied to the gas moving device 13 and air (or other gas if utilised) is moved up to or in some cases one or three side walls across the top of the container (unless blocked to direct the  
30 flow through the produce) and down the remaining two or three or one side walls back into the

base. It will be apparent that the roles of the base and top could be reversed in some instances although having the cooling and gas moving functions in the base enables it is believed a simpler construction. The construction has the advantage of shipping a collapsible container on a pallet.

5 In summary this embodiment of the invention in a preferred form could be described as a pallet base, with internal air plenums, a fan, four side walls and one horizontal roof wall. The walls contain air ducts. The fan forces air up two walls, across the roof, down two walls and back to the fan thus completing the air distribution cycles. This unique configuration enables two independent air cycles to work at 90 degrees to each other. Because the air is evenly forced  
10 through all the walls, heat transfer through the container walls is controlled accurately. This is ideal for non-respiring perishable products such as meat, which is typically packaged in boxes which do not contain air vents.

This construction forms essentially a cool gas "blanket" about the produce and is particularly  
15 suitable for meat products which give off little or no heat while stored and/or transported. The "blanket" in effect insulates the contents in the container from the outside ambient air.

For perishable horticultural products which respire and give off heat, it is necessary for the temperature controlled air to flow through the vents in the product boxes and around and/or  
20 across the product to take away the heat and control the product's temperature accurately. In this case either of the following air distribution options could be used.

Up through one side wall and across to its opposite side wall as shown in Figures 17 and Figure  
18.

25

In this form of the invention, air is forced from the fan, up one wall 60, through apertures 61 located within its inner wall 62 (on the cargo side), through the cargo and across to its opposite side wall 63, through holes 64 located in the inner wall of the second or opposite side wall, and through this wall back to the fan.

30



In this embodiment the aperture 61 should, in area, be less than, or at most, equal to the area of the input to the ducts. If the total area is close to the input area then desirably upper apertures should be larger than lower apertures. When the aperture area is much less, such graduation is less necessary.

Up four walls and down through the cargo, as shown in Figure 19.

An alternative form of the invention provides an air circulation system that enables the air to travel up each of the four walls 70 to the top of the loaded pallet, into a plenum, not shown in Figure 19, but referenced 71 in Figure 20.

Apertures 72 would be provided in plate 14 to maintain even air flow distribution. In an alternative embodiment an apertured plate (not shown) could be placed near the top of the walls to form a plenum chamber through which the air passes.

Up the cargo and down through one or more side walls, as shown in Figure 20.

In yet another form of the invention air is forced from the fan up through a plenum 80 located underneath the cargo 81, up through the cargo and returns down and through one or more walls 82 back to the fan.

This construction is essentially the reverse of the construction of Figure 19 in respect of the air flow direction.

Figure 21 part (a) to (n) shows an assembly sequence of the construction.

In Figure 21 (a) the parts of the container are shown arriving. In 21 (b) produce is stacked onto a pallet 1, and in (c) the produce is optionally wrapped for example using shrink film.

In (d) to (f) the first of the gas directing panels is folding into shape and in (g) is placed over the produce. In (h) the second panel also folded is placed over the first panel and these are sealed at (i). In (j) to (l) a similar procedure is followed with insulation panels which also extend over the  
5 pallet 1. The box may be wrapped in shrink film at this stage to seal gaps between cardboard. Alternatively a bag could be used. Drawings (m) to (n) show the loaded container of the invention being lifted and loaded into a larger shipping container. This construction is for an embodiment where gas passes up two sides, across the top and down the other two sides. The air  
10 paths at the top cross over but are not intersecting.

Thus it can be seen that a container is provided which at least in the preferred forms, allows cargo to be cooled (or heated, if the refrigeration plant is replaced with a heater) in a manner such that hot spots (or cool spots) are minimised even with small containers.

**CLAIMS:**

1. A container comprising a base, a plurality of side walls and a top, at least some of the side  
5 walls having ducts therein through which gas can flow.
2. A container is claimed in claim 1 wherein four side walls are provided.
3. A container as claimed in claim 2 wherein at least two side walls include such ducts.  
10
4. A container as claimed in any one of claims 1 to 3 wherein at least one of the top and base  
include such ducts..
5. A container as claimed in any one of the preceding claims wherein the gas moves up a pair  
15 of such walls and down the remaining pair of side walls, the pair pathways crossing each  
other at the top without intersection of the pathways.
6. A container as claimed in any one of claims 1 to 4 wherein the gas moves up all side walls  
20 to the top, the top being apertured so that the gas returns to the base through the body of the  
container.
7. A container as claimed in any one of claims 1 to 4 the side walls contain apertures on the  
inner face of the wall through which gas can pass through the body of the container to the  
25 base, or to apertures in an opposite side.
8. A container as claimed in claim 7 wherein the apertures are smaller towards the bottom end  
in use of the walls and larger towards the top end of the walls in use.
9. A container as claimed in any one of the preceding claims wherein gas moving means are  
30 provided in the base of the container.

10. A container as claimed in any one of the preceding claims wherein the walls are of a fluted construction so that the flutes provide the ducts.
- 5 11. A container as claimed in any one of the preceding claims wherein the base is positioned on a pallet or the base includes a pallet configuration.
12. A container as claimed in any one of the preceding claims wherein the gas comprises a cooled gas.
- 10 13. A container as claimed in any one of claims 1 to 11 wherein the gas comprises a heated gas.
14. A container as claimed in any one of the preceding claims wherein the gas comprises air.
- 15 15. A container comprising a base, a plurality of side walls and a top, there being ducts within at least some side walls, and a gas moving device arranged to direct gas through said ducts.
16. A container as claimed in claim 15 wherein the gas is directed up two side walls and down two side walls.
- 20 17. A container as claimed in claim 15 or claim 16 wherein two separate gas paths are provided.
18. A container as claimed in any one of claims 15 to 17 wherein the gas moving means is provided in the base or top and directs the gas to side walls and receives gas from two side walls.
- 25 19. A container as claimed in any one of claims 15 to 18 wherein the top includes two chambers or sets of ducts, gas in one gas path passing through one chamber or set of ducts and gas in the other gas path passing through the other.
- 30

20. A container as claimed in any one of claims 15 to 19 wherein the base provides a gas receiving chamber and a gas supplying chamber, the gas moving device, moving gas from  
5 the gas receiving chamber to the supply chamber.
21. A container as claimed in any one of claims 15 to 20 wherein the top is made from fluted cardboard and the walls are made from fluted cardboard.
- 10 22. A container as claimed in any one of claims 15 to 21 wherein the container is insulated.
23. A container as claimed in any one of claims 15 to 22 wherein the base chambers formed by first tray open at two side walls, and a second tray open to the other two side walls.
- 15 24. A container as claimed in any one of claims 15 to 23 wherein the base is mounted on a pallet.
25. A container as claimed in claim 22 at least the sides and top are insulated at least on the outer surface.
- 20 26. A method of maintaining the temperature of or cooling a container having a top, a bottom, and a plurality of side walls comprising the steps of directing a flow of gas at the desired temperature up or down through one or more sides of the container and allowing the gas to return down or up through other side walls, or through the body of the container.
- 25 27. A method as claimed in claim 26 wherein the gas moves up two side walls and down two side walls.
28. A container substantially as herein described with reference to the accompanying drawings.

30

29. A method as claimed in claim 26 and substantially as herein described with reference to the accompanying drawings.

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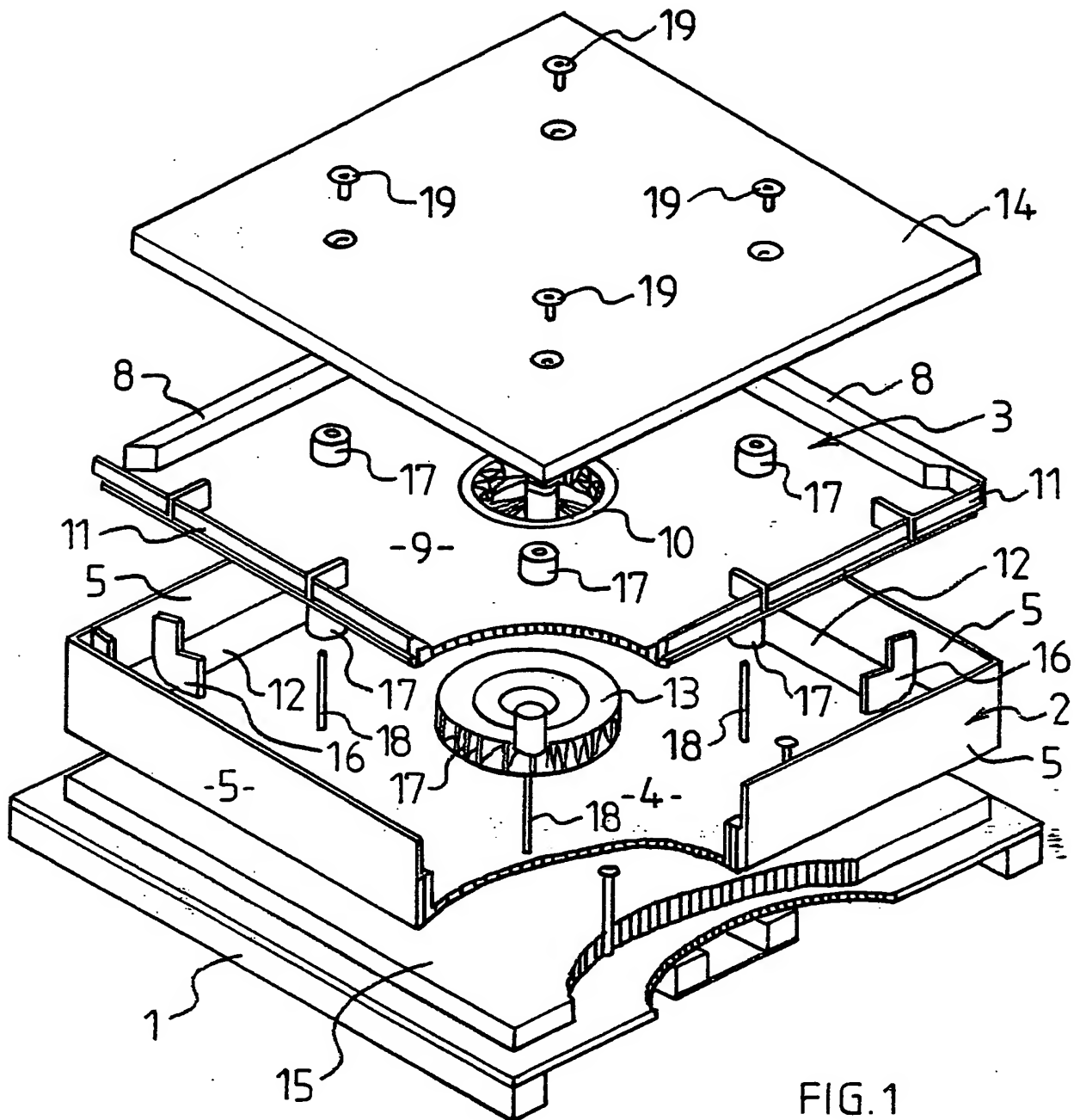


FIG.1

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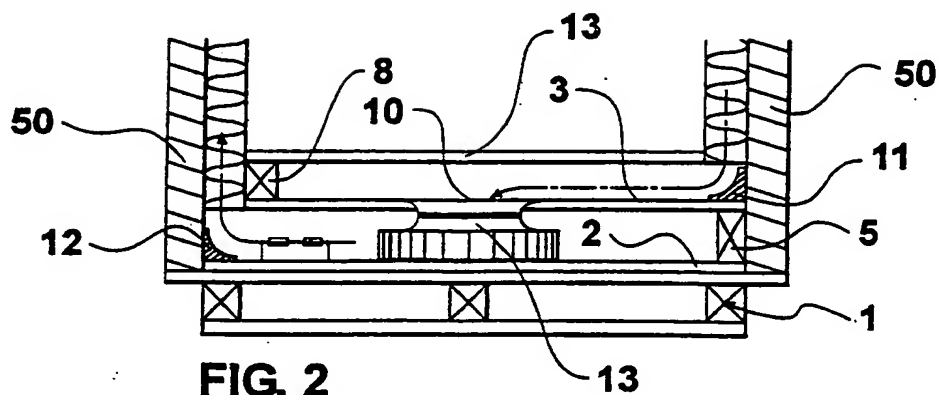


FIG. 2

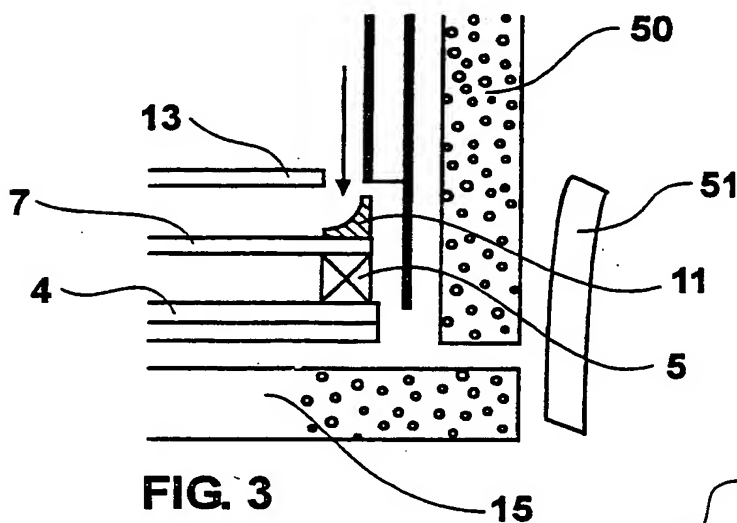


FIG. 3

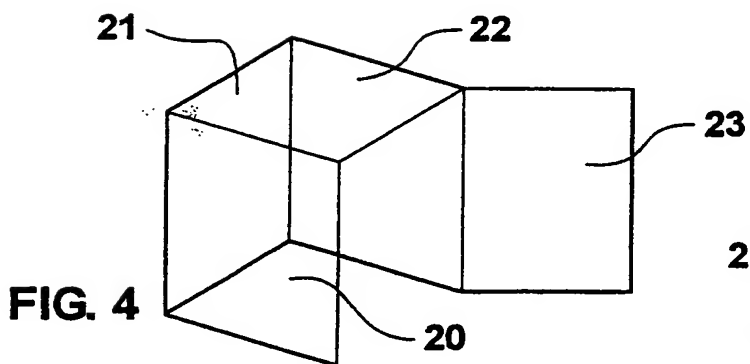


FIG. 4

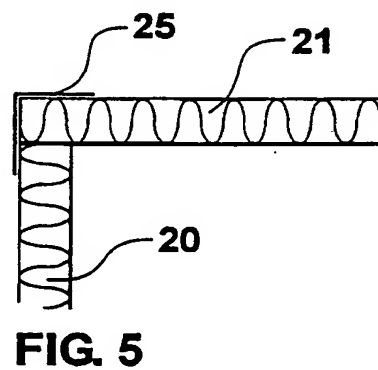


FIG. 5

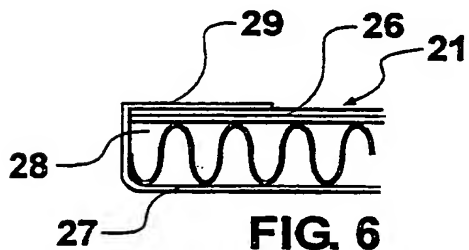


FIG. 6

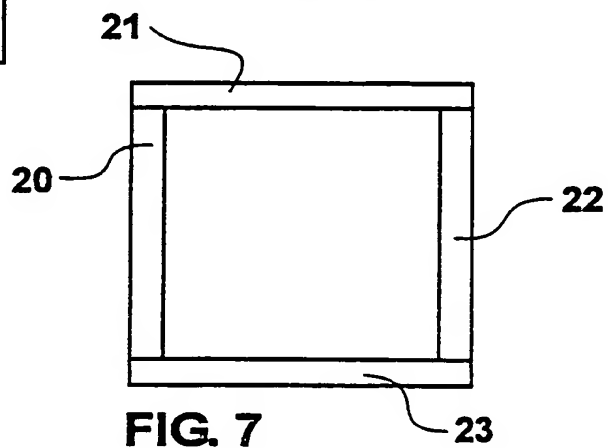


FIG. 7



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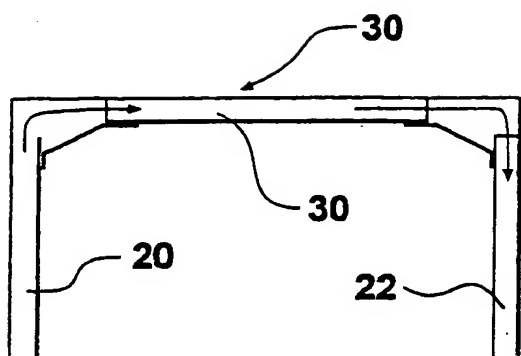


FIG. 8

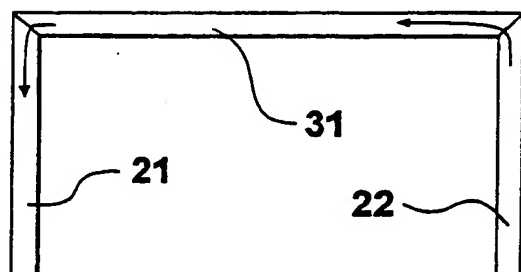


FIG. 9

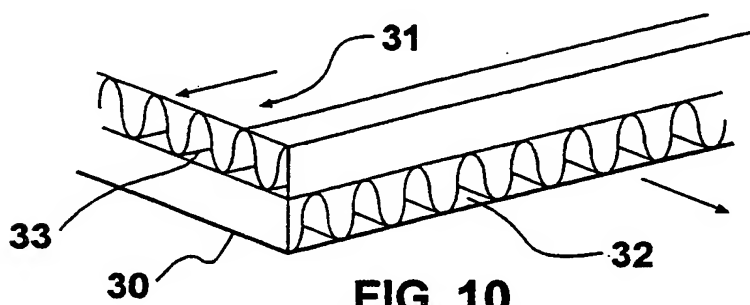


FIG. 10

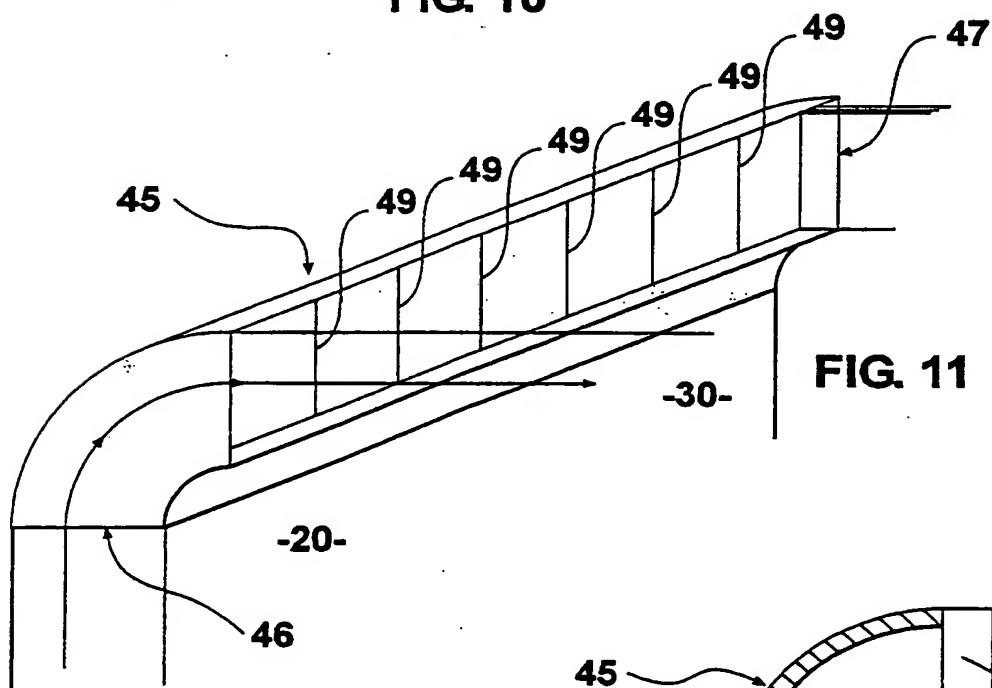


FIG. 11

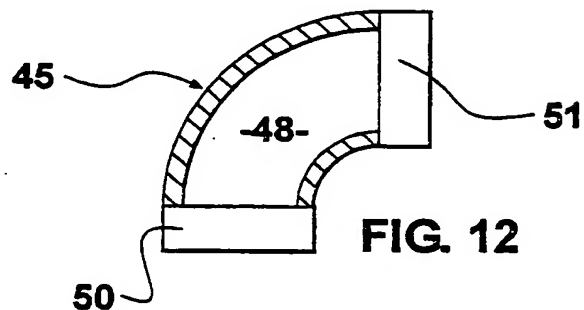


FIG. 12

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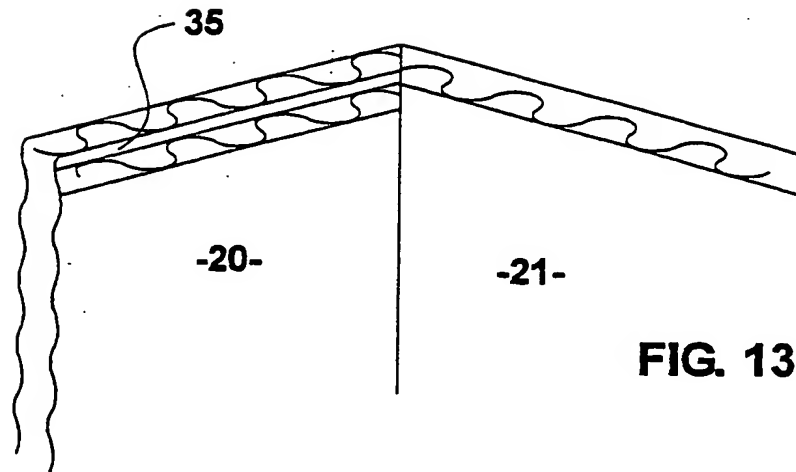


FIG. 13

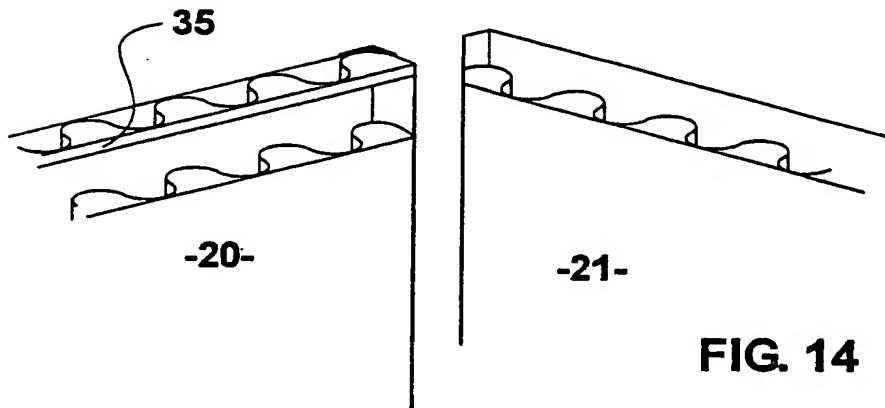


FIG. 14

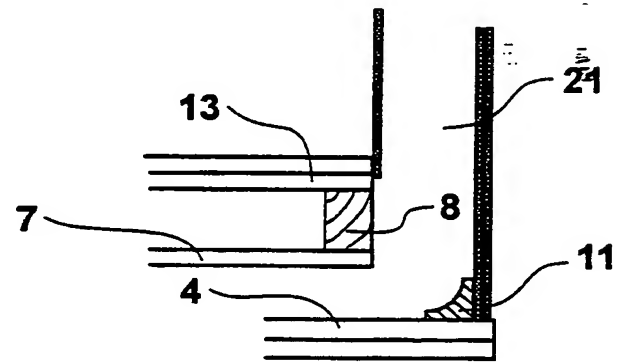


FIG. 16

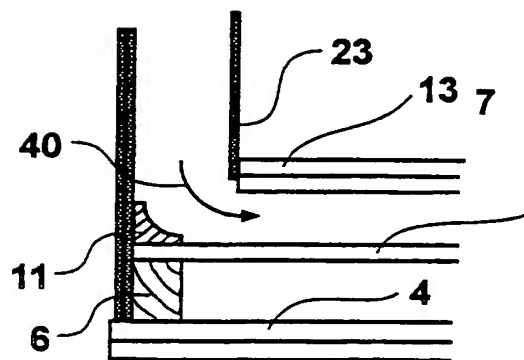


FIG. 15

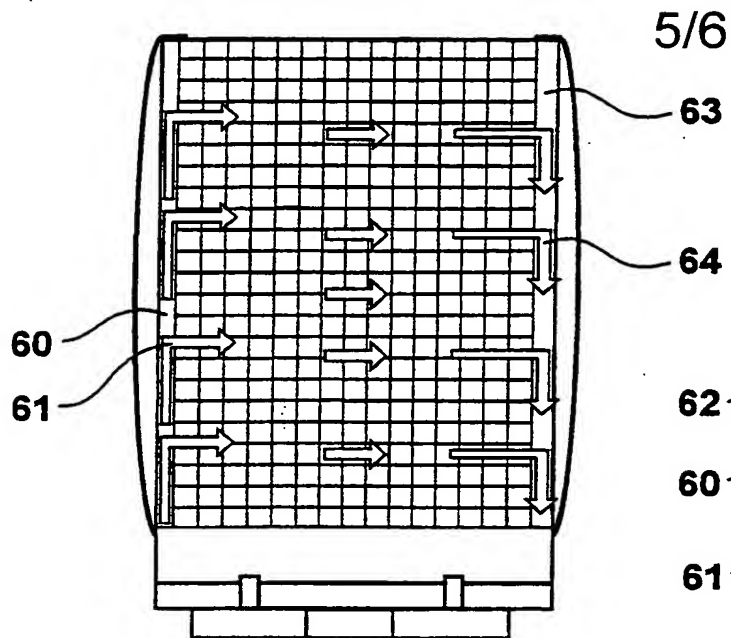


FIG. 17

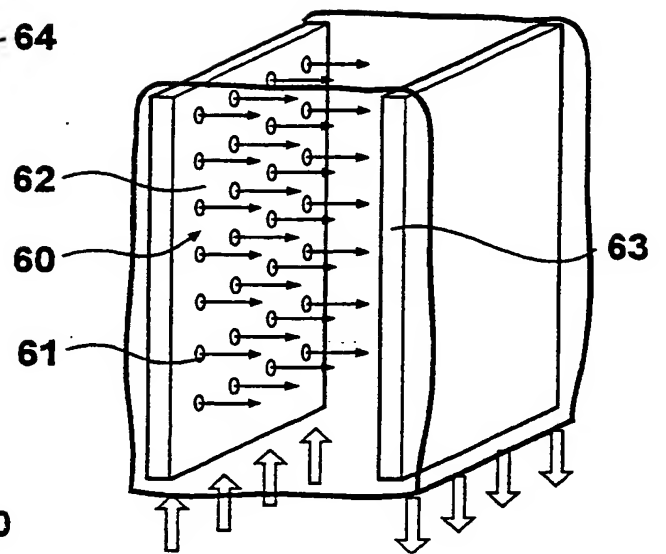


FIG. 18

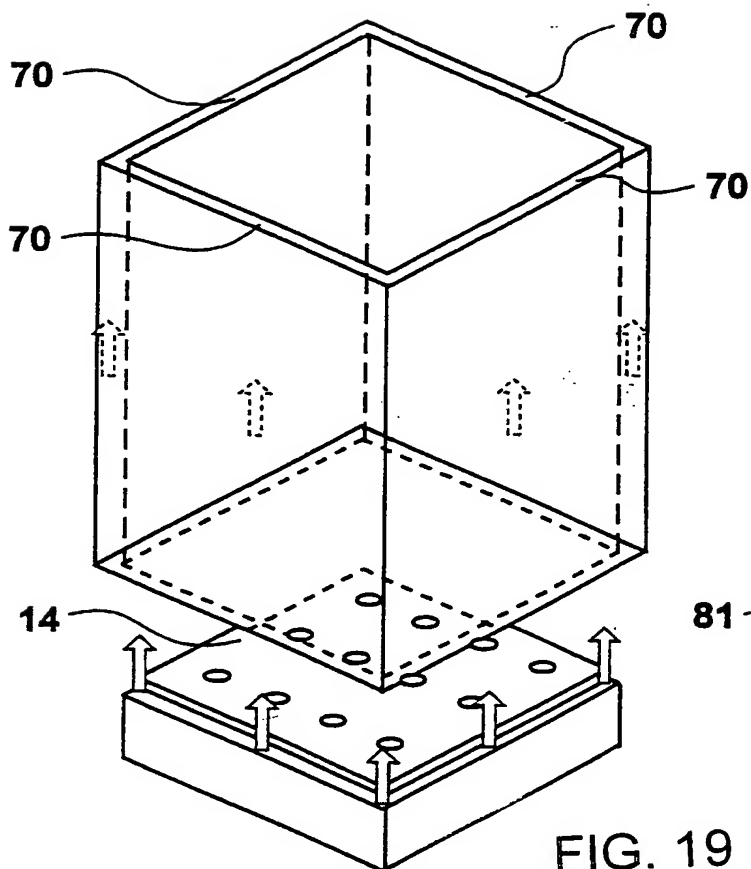


FIG. 19

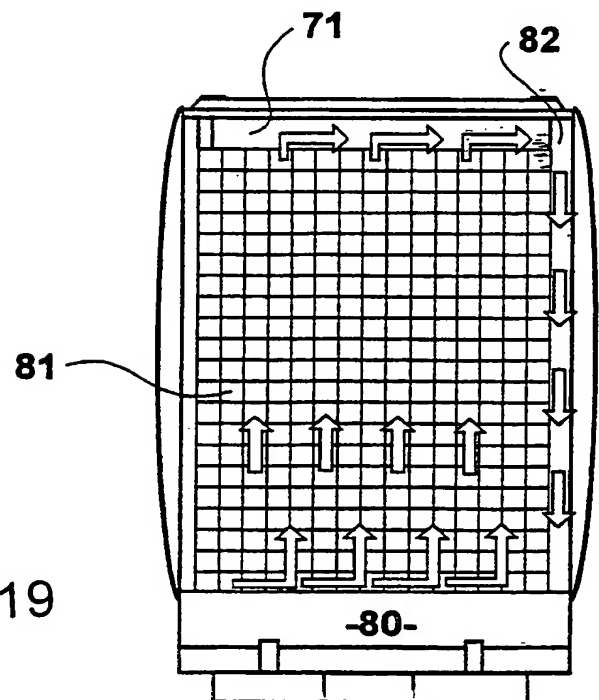


FIG. 20

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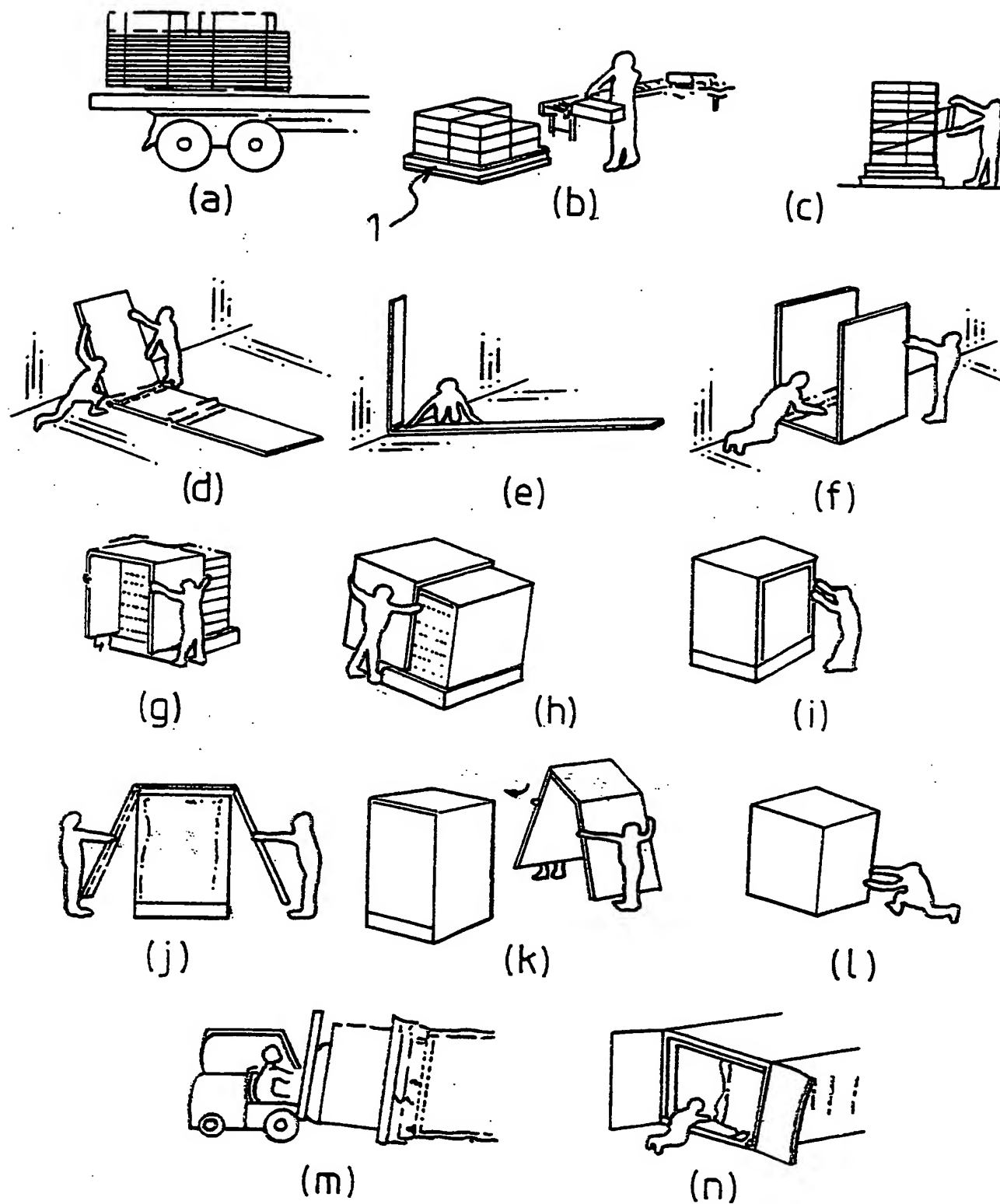


FIG. 21

# INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/NZ00/00092**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>				
Int. Cl. <sup>7</sup> : B65D 81/18, 88/74, 3/22				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
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<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
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X	US 4386703 A (THOMPSON et al.) 7 June 1983 Figures, column 2, lines 43-55	1-29		
X	US 5548967 A (GHIRALDI) 27 August 1996 Figure 4, column 5, lines 9-15	1-29		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex				
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Date of the actual completion of the international search <b>16 October 2000</b>		Date of mailing of the international search report <b>23 OCT 2000</b>		
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer  <b>A. ALI</b> Telephone No : (02) 6283 2607		

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ00/00092

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Category*	Citation of document, with indication, where appropriate, of the relevant passages (Remove spaces when completed if the page is too long)	Relevant to claim No.
X	WO 95/22729 A (TRANSPHERE SYSTEMS LIMITED) 24 August 1995 Abstract, figure 12	1-29
X	EP 0832826 A (CORNERSTONE TECHNOLOGIES LTD.) 1 April 1998 Figure 8a, abstract	1-29
X	Derwent Abstract Accession No. 97-510632/47, class Q34, RU 2078494 C1 (BANSCHIKOV) 10 May 1997 abstract	1-29
X	Derwent Abstract Accession No. 94-023811/03, class P12, SU 1784134 A (ODESS MARINE FLEET ENG INST) 30 December 1992 abstract	1-29
A	WO 95/22728 A (TRANSPHERE SYSTEMS LIMITED) 24 August 1995 Abstract, figure 26	
A	WO 90/05098 A (BON BON PLASTIC PRODUCTS PTY LTD) 17 May 1990 Abstract, figure 1	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/NZ00/00092

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US 4386703	NIL				
US 5548967	AU 11306/95	BR 9500282	CA 2140829	CN 1111342	
	EP 664426	IT 1269458	JP 8084578	ZA 9500367	
WO 95/22729	AU 17205/95	BG 100844	BR 9506814	CA 2183318	
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WO 90/05098	AU 45104/89	US 5156290			
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(19) World Intellectual Property Organization  
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(43) International Publication Date  
14 December 2000 (14.12.2000)

PCT

(10) International Publication Number  
**WO 00/75041 A1**

(51) International Patent Classification<sup>7</sup>: B65D 81/18,  
88/74, 3/22

(72) Inventor; and

(75) Inventor/Applicant (for US only): BOLLEN, Arthur,  
Frank [NZ/NZ]; Old School Road, Ngahinapouri (NZ).

(21) International Application Number: PCT/NZ00/00092

(74) Agents: PIPER, James, William et al.; Pipers, P.O. Box  
5298, Wellesley Street, Auckland 1036 (NZ).

(22) International Filing Date: 7 June 2000 (07.06.2000)

(25) Filing Language: English

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AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE,  
DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,  
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(26) Publication Language: English

(30) Priority Data:  
336144 8 June 1999 (08.06.1999) NZ

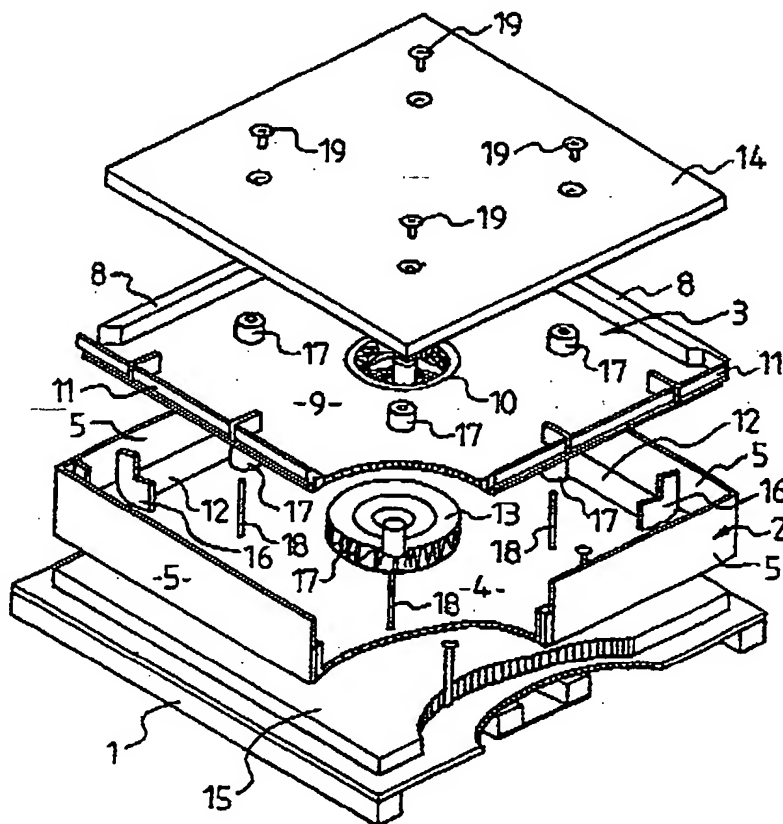
(71) Applicant (for all designated States except US): QPOD  
SYSTEMS LIMITED [NZ/NZ]; 2/174 Marua Road, Mt.  
Wellington 1006, Auckland (NZ).

(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

[Continued on next page]

(54) Title: CONTAINER

(57) Abstract: The invention relates to  
containers which can be placed within a  
shipping container. At least one wall (20,  
21, 22, 23) of the container has ducts (32,  
33) through which cooling (or heated) gas  
may pass.



WO 00/75041 A1



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NZ00/00092

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Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer A. ALI Telephone No: (02) 6283 2607																				

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